REMARKS

Claims 18, 26-40, 42, 48, 55-63, 65, and 71 have been canceled, and claims 86-121 have been added. Thus, claims 16-17, 19-25, 41, 43-47, 49-54, 64, 66-70, 72-121 are now pending in this case.

The specification has been amended to insert language corresponding to language used in the claims. Support for this language may be found in the drawings, as well as the specification itself. For example, figure 1 shows a mask 1 that includes a mask body and a harness strap 2. Figure 2 shows an exhalation valve that has a valve seat 5 and a valve cover 6. Figure 4 shows how the flap has stationary and fixed portions with stationary and free edges. The specification explains (in the paragraph beginning at column 3, line 44) how edges of the flap lift from and reseat upon the seal surface. Figures 3-5 show how the seal ridge 9A, 9B, 9C terminates in a seal surface, and Figures 4 and 5 illustrate how block 16 engages the flap 7 such that a portion of the flap resides in non-alignment with the sealing surface.

The claims have been amended to overcome the rejection under 35 USC § 112.

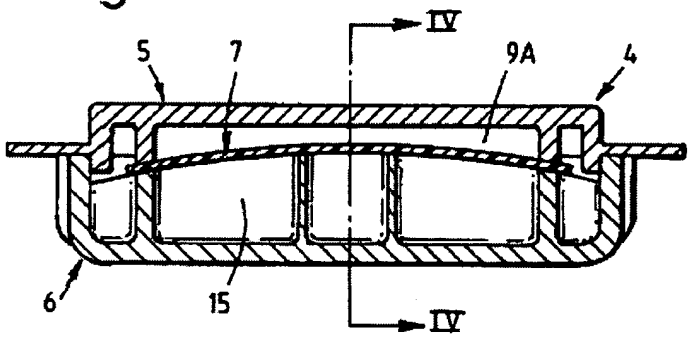
Claims 55, 57, 58, 62, and 66 have been rejected under 35 USC § 102(b) as being anticipated by U.S. Patent 5,295,478 to Baldwin. Of these claims, only claim 66 remains pending. But because the Examiner indicated that claim 65 would be allowable if written in independent form, and because applicants have amended claim 64 to include all the limitations of claim 65, this rejection is no longer an issue in this case.

Please note, however, that claim 64 requires that the flexible flap exhibit "a curvature in a direction transverse to the flap's longitudinal dimension" to bias the flexible flap to seal surface. Baldwin does not disclose a flexible flap that is transversely curved. In Baldwin, the flap is only curved in the longitudinal dimension. Applicant's specification explains the difference between a flap that is curved in a longitudinal dimension but not in a the transverse dimension. In the background of the invention, applicant comments on U.S. Patent 5,325,892 to Japuntich et al. (Japuntich). As applicant explains, this flap [Japuntich] is "curved in the longitudinal direction of the flap". Applicants indicate that their invention is different from the Japuntich construction in that their flap has a "transverse curvature".[1] As the terms "longitudinal" and "transverse" are used

[1] Please see applicant's specification at column 1, lines 55 to column 31, of the originally issued 5,687,767 patent.

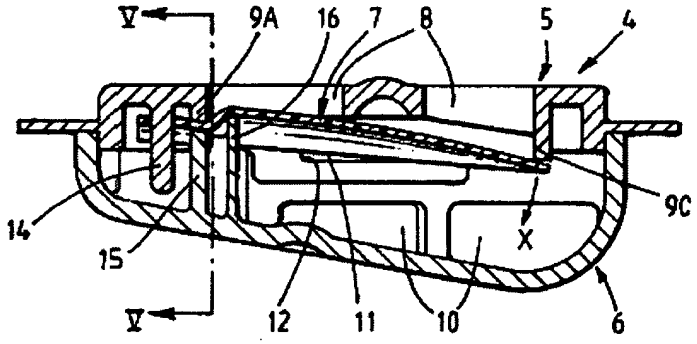
in applicant's specification and in the claims, the longitudinal dimension is the dimension that extends from the stationary portion of the flap towards the free peripheral edge of the flap; whereas the transverse dimension extends across the flap, normal to the longitudinal direction. The Examiner's attention is directed in particular, to Figure 5 of applicant's specification, which shows an arched transverse curvature that extends across the flap:

Fig.5.



Although applicant's flap may also be curved in the longitudinal dimension as shown in Figure 4:

Fig.4.



it also possesses the transverse curvature shown above in FIG. 5.

A longitudinally-curved flap is also described in the '892 Japuntich patent.:

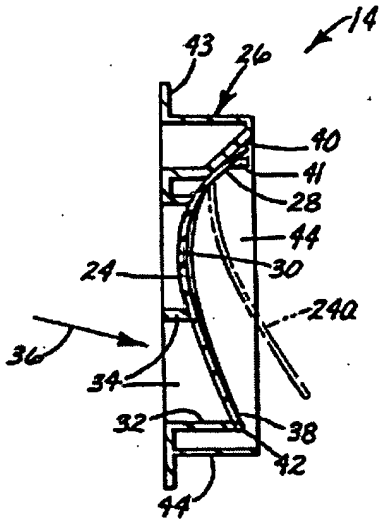
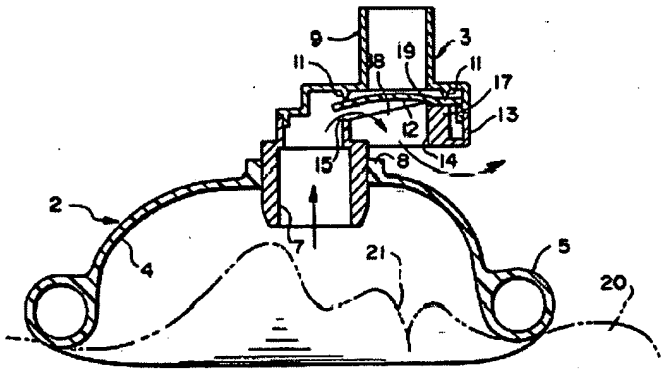


Fig. 3

The valve that is used in the Baldwin resuscitator also is curved in its longitudinal dimension:



Baldwin does not, however, show that its flap is curved transversely. As explained in applicant's specification, "the effect of the transverse curvature of the flap and valve according to the invention is therefore to stiffen the flap sufficiently to resist any drooping away from the seat when there is no applied pressure differential, even in the inverted orientation of the structure." Applicant further explains that "[t]he stiffening effect of this transverse curvature is therefore to be distinguished from the longitudinal curvature of the flap in U.S. Patent No. 5,325,892 [to Japuntich et al.]." Because Baldwin does not disclose the use of a flexible flap that is transversely curved, the Baldwin patent does not anticipate applicant's invention under the meaning of 35 USC § 102.

Claims 16, 17, 19-30, 36-41, 44-46, 60, 61, 64,and 67-69 have been rejected under 35 USC § 103(a) as being unpatentable over Japuntich in view of Baldwin. Applicant respectfully submits that this rejection also cannot be sustained.

As just indicated, neither Japuntich nor Baldwin discloses a valve that is constructed to enable the flap to be curved in the transverse dimension. Japuntich and Baldwin only curve their flaps in the longitudinal dimension. While applicant's flap may be curved in this direction, it is also curved transversely. The use of a transverse curvature on the flap keeps the flap in substantial contact with the valve's seal surface under any orientation of the mask. Neither Japuntich nor Baldwin teach or suggest this construction or the benefits that may be achieved from it. Accordingly, these documents, whether taken alone or in combination, would not have made applicant's invention obvious to a person of ordinary skill within the meaning of 35 USC § 103.

Applicant's claims have been rejected under the judicially-created doctrine of obvious-type double patenting over U.S. Patent No. RE37,974. Applicants have enclosed a Terminal Disclaimer to eliminate any issue with respect to this double patenting rejection.

This application also has been rejected under 35 USC § 251 for a defective oath/declaration. The Examiner states that his review of the foreign priority application (GB 9515986) indicates that this application was filed on July 26, 1995. The Examiner has partially confused the filing date of the GB priority application with the filing date of the '839 application, which is July 26, 1996 and which issued as U.S. Patent 5,687,767. GB 9515986 has a filing date of August 4, 1995. Applicant has enclosed a copy of the British "Request for grant of a Patent", and a signed supplemental oath/declaration under 37 CFR § 1.175(b)(1) will be forthcoming to correct this date.

Claims 16-85 have been rejected under 35 USC § 251 for improperly recapturing subject matter that was surrendered in the application for patent upon which the present reissue is based.

The claims that are presently pending in this reissue application do not involve recapture estoppel because the patent applicant is not estopped to seek reissue claims that are *different* in scope from those canceled in his or her original patent application. For purposes of defeating recapture estoppel, reissue claims are deemed different in scope from originally canceled claims if they are narrower in an aspect germane to the previously issued prior art rejection, even though

they may be broader in some other regard than previously canceled claims.[2] A comparison to the claims surrendered during the original prosecution reveals that each of the claims that are now pending in this case recite additional limitations germane to the prior art rejections thereby avoiding recapture. For example, claim 16 as amended indicates that the transverse curvature extends "medially of the lap" and that the curvature is "imparted to the flexible flap by virtue of the root end of the flexible flap being held against the flap engaging member such that a portion of the flap resides in non-alignment with the sealing surface of the upper housing member when the valve is viewed in a longitudinal section (FIG. 4)." These limitations narrow pending claim 16 significantly. Independent claim 16 thus avoids recapture issues.

Independent claim 41 has been amended to include all the limitations of allowed claim 42. This claim therefore is also allowable. Independent claims 47 and 70 have been significantly reworded to read more clearly. Claims 47 and 70, both before and after the present amendments, include narrowing limitations germane to the previous prior art rejections, and thus there should be no recapture issue for these claims. Claim 70, for example, notes that the flexible flap is mounted at the stationary portion of the flap "off-center relative to the flap and closer to the stationary segment of the flap's peripheral edge than to the free segment." The claim further states that the mounting of the flexible flap at the stationary portion is "accomplished by having a member from the valve cover press against the flap to create curvature in the flap at the point where the member contacts the flap to cause at least part of the stationary portion to reside in nonalignment with the seal surface when viewing the flap in a longitudinal section." Claim 64 has been amended to include all the limitations of allowable claim 65. Therefore, claim 64 should now be allowed. Newly-presented independent claims 86, 89, 92, 104, 111, and 120, as

[2] *In re Clement*, 131 F.3d 1464, 1470, 45 USPQ2d 1161, 1165 (Fed. Cir. 1997) ("In both *Mentor* and *Ball*, the relevance of the prior art rejection to the aspects narrowed in the reissue claim was an important factor in our analysis. From the results and reasoning of those cases, the following principles flow: (1) if the reissue claim is as broad as or broader than the canceled or amended claim [the surrendered subject matter] in all aspects, the recapture rule bars the claim; (2) if it is narrower [than the surrendered subject matter] in all aspects, the recapture rule does not apply, but other rejections are possible; (3) if the reissue claim is broader [than the surrendered subject matter] in some aspects, but narrower [than the surrendered subject matter] in others, then: (a) if the reissue claim is as broad as or broader in an aspect germane to a prior art rejection, but narrower in another aspect completely unrelated to the rejection, the recapture rule bars the claim; (b) if the reissue claim is narrower in an aspect germane to [a] prior art rejection, and broader in an aspect unrelated to the rejection, the recapture rule does not bar the claim, but other rejections are possible."); *Mentor Corp. v. Coloplast, Inc.*, 998 F.2d 992, 27 USPQ2d 1521 (Fed. Cir. 1993); *Ball*

Examiner will note, also include many narrowing limitations germane to the previous prior art rejections when compared to those claims surrendered during prosecution. Accordingly, applicant believes that all claims are now allowable.

In compliance with 37 CFR § 1.178, applicants inform the United States Patent and Trademark Office of litigation that has been commenced with respect to RE37,974E. The 3M Company and the 3M Innovative Properties Company, the owner of the present application have sued Moldex-Metric, Inc. in the United States District Court, District of Minnesota (Civil Action No. 03-5292).

Respectfully submitted,

October 16, 2003
Date

By: _____
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Telephone No.: (651) 736-7776

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833

Corp. v. US, 729 F.2d 1429, 221 USPQ 289 (Fed. Cir. 1984); *In re Richman*, 409 F.2d 269, 161 USPQ 359 (CCPA 1969); *Ex parte Eggert*, 67 USPQ2d 1716, 1729 (Bd. Pat. App. & Int. 2003).

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The Patent Office

Request for grant of a Patent

Form 1/77

Patents Act 1977

❶ Title of invention

1 Please give the title of the invention: Uni-Directional Fluid Valve

❷ Applicant's details

☐ **First or only applicant**

2a If you are applying as a corporate body please give:

Corporate name: Racal Health & Safety Limited

Country *(and State of incorporation, if appropriate)*: England

2b If you are applying as an individual or one of a partnership please give in full:

Surname

Forenames

2c **In all cases**, please give the following details:

Address: Western Road
Bracknell
Berkshire

UK postcode *(if applicable)*: RG12 1RG

Country: England

ADP number *(if known)*: 6131874001

2d, 2e and 2f: If there are further applicants please provide details on a separate sheet of paper.

i Second applicant *(if any)*

2d If you are applying as a corporate body please give:

Corporate name

Country *(and State of incorporation, if appropriate)*

2e If you are applying as an individual or one of a partnership please give

Surname

Forenames

2f **In all cases**, please give the following details:

Address

UK postcode *(if applicable)*

Country

ADP number *(if known)*

❸ An address for service in the United Kingdom must be supplied

Please mark correct box

❸ Address for service details

3a Have you appointed an agent to deal with your application?

Yes [X] No [ ] ➡ *go to 3b*

↓ *please give details below*

Agent's name: R.W. Obee

Agent's address: Group Patents Department
Racal Group Services Limited
Richmond Court
309 Fleet Road
Fleet
Hampshire

Postcode: GU13 8BU

Agent's ADP number: 2647160021

3b: If you have appointed an agent, all correspondence concerning your application will be sent to the agent's United Kingdom address.

3b If you have not appointed an agent please give a name and address in the United Kingdom to which all correspondence will be sent:

Name

Address

Postcode

Daytime telephone number *(if available)*

ADP number *(if known)*

Reference number

4 Agent's or applicant's reference number *(if applicable)* 09/95

⑤ Claiming an earlier application date

5 Are you claiming that this application be treated as having been filed on the date of filing of an earlier application?

Please mark correct box

Yes ☐ No ☒ ➡ ***go to 6***

↓

please give details below

❑ number of earlier application or patent number

❑ filing date

(day month year)

❑ and the Section of the Patents Act 1977 under which you are claiming:

Please mark correct box

15(4) (Divisional) ☐ 8(3) ☐ 12(6) ☐ 37(4) ☐

⑥ Declaration of priority

⑥ If you are declaring priority from a PCT Application please enter 'PCT' as the country and enter the country code (for example, GB) as part of the application number.

6 If you are declaring priority from previous application(s), please give:

Please give the date in all number format, for example, 31/05/90 for 31 May 1990.

Country of filing	Priority application number *(if known)*	Filing date *(day, month, year)*

❼ *The answer must be 'No' if:*
- *any applicant is not an inventor*
- *there is an inventor who is not an applicant, or*
- *any applicant is a corporate body.*

❼ Inventorship

7 Are you (the applicant or applicants) the sole inventor or the joint in

Please mark correct box

Yes [ ] No [X] ➡ ***A Statement of Inventorship on Patents Form 7/77 will need to be filed (see Rule 15).***

❽ *Please supply duplicates of claim(s), abstract, description and drawing(s).*

❽ Checklist

8a Please fill in the number of sheets for each of the following types of document contained in this application.

Continuation sheets for this Patents Form 1/77			
Claim(s)		Description	6
Abstract		Drawing(s)	4

8b Which of the following documents also accompanies the application?

Please mark correct box(es)

Priority documents *(please state how many)*	
Translation(s) of Priority documents *(please state how many)*	
Patents Form 7/77 – Statement of Inventorship and Right to Grant *(please state how many)*	
Patents Form 9/77 – Preliminary Examination/Search	
Patents Form 10/77 – Request for Substantive Examination	

❾ *You or your appointed agent (see Rule 90 of the Patents Rules 1990) must sign this request.*

❾ Request

I/We request the grant of a patent on the basis of this application.

Please sign here ➡

Signed Authorised Agent

Date 03 (day) 08 (month) 95 (year)

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16. (currently amended) An exhalation permitting filter mask assembly for positioning over the mouth and nose of a user, the filter mask assembly comprising:

a mask configured to fit over the nose and mouth of a user and including filter material through which air can be inhaled by a user while effecting filtration of the inhaled air;

a uni-directional valve mounted to the mask for permitting exhalation through the valve while precluding inhalation through the valve;

the valve including a flexible flap having a root end portion, opposite side portions and a free end portion, an upper housing member, an inlet port and a valve seat surrounding the inlet port and being part of the upper housing member and including a sealing surface adjacent the inlet port;

the valve further including a lower housing member that includes a flap-engaging member;

the flexible flap being fixedly mounted at the root end relative to the upper housing member in a manner so that the free end portion makes sealing contact with the sealing surface when the flexible flap is closed and so that the free end portion of the flexible flap lifts from contact with the sealing surface and moves outwardly of the sealing surface when exhaled air passes through the inlet port; and

the flexible flap having a transverse curvature extending medially of the flap imparting sufficient stiffening to the flexible flap to maintain the flexible flap in sealing contact with the sealing surface for any orientation of the filter mask during normal operating conditions in the absence of a pressure differential across the flexible flap

wherein the transverse curvature is imparted to the flexible flap by having the flap-engaging member contact the root end of the flexible flap such that the flap is held against the sealing surface of the upper housing member and such that a portion of the flap resides in non-alignment with the sealing surface of the upper housing member when the valve is viewed in a longitudinal section (FIG. 4).

17. (previously presented) A filter mask assembly as recited in claim 16, wherein the flexible flap is formed of elastomeric material.

18. (canceled)

19. (previously presented) A filter mask assembly as recited in claim 16, additionally including a lower housing member facing the upper housing member wherein the root end of the flexible flap is trapped and fixedly positioned between facing surfaces of the upper housing member and the lower housing member.

20. (previously presented) A filter mask assembly as recited in claim 19, wherein the facing surface of the lower housing member is a curved surface.

21. (previously presented) A filter mask assembly as recited in claim 19, wherein that part of the sealing surface of the valve seat which the free end of the flexible flap contacts is a flat surface.

22. (previously presented) A filter mask assembly as recited in claim 19, wherein the sealing surface is provided on a portion of a seal ridge surrounding the inlet port.

23. (previously presented) A filter mask assembly as recited in claim 22, wherein the seal ridge comprises four linear seal ridge members and the facing surface on the lower housing is provided on a profiled block aligned with one of the linear seal ridge members.

24. (previously presented) A filter mask assembly as recited in claim 23, additionally including a second profiled block provided in the lower housing member engaging a central portion of the flexible flap outwardly of the root end to urge the central portion toward the upper housing to enhance the transverse curvature of the flexible flap.

25. (previously presented) A filter mask as recited in claim 16, wherein the filter material comprises at least one sheet incorporating filter material.

26-40 (canceled)

41. (currently amended) A filter face mask comprising:

a mask body adapted to fit over a nose and a mouth of a wearer; and

an exhalation valve mounted to the mask body;

the exhalation valve comprising a flexible flap and a valve seat;

the flexible flap being mounted to the valve seat in cantilever fashion for movement between open and closed positions;

the flexible flap having a longitudinal dimension and a free end that rests upon the valve seat when in closed position;

the flexible flap also having a transverse curvature in a direction transverse to the flap's longitudinal dimension;

the transverse curvature biasing the flexible flap to effect positioning and retention of the flexible flap in the closed position in the absence of an opening pressure differential across the flap for any orientation of the valve

wherein the flexible flap has maximum transverse curvature at the location where the flexible flap is mounted to the valve seat.

42. (canceled)

43. (currently amended) The filter mask of claim 41, wherein the transverse curvature of the flexible flap progressively decreases toward the free end of the flexible flap.

44. (previously presented) The filter mask of claim 41, wherein the transverse curvature is imparted to the flexible flap by virtue of its mounting to the valve seat.

45. (previously presented) The filter mask of claim 44, wherein the flexible flap is mounted to the valve seat by being pressed towards the seat by a member disposed on a valve cover.

46. (previously presented) The filter mask of claim 41, wherein the exhalation valve is so located on the mask such that during normal head movements of a wearer, the free end of the flexible flap is generally directed downwardly.

47. (currently amended) A filter face mask that comprises:

a mask body adapted to fit over a nose and mouth of a wearer for filtering inhalation air; and

an exhalation valve mounted to the mask body, the exhalation valve including a flexible flap, a first housing defining a valve seat and including a seal ridge terminating in a seal surface, and a second housing defining a valve cover;

the first housing including one or more inlet ports, the one or more inlet ports being surrounded by the seal ridge;

the second housing including one or more outlet ports and being joined to the first housing;

the flexible flap having only one stationary portion and only one free portion and a peripheral edge that includes both stationary and free segments, the flap also having a longitudinal axis extending in a direction between the free and stationary segments of the flap;

the stationary portion of the flexible flap being held in a stationary position in contact with a portion of the seal ridge such that the stationary segment of the peripheral edge remains stationary during exhalation, and the free portion of the flap being movable during exhalation such that the free segment of the peripheral edge moves away from the seal surface and the free portion of the flap lifts off of the seal surface; and

the flexible flap having a curvature in a direction transverse to the longitudinal axis, the transverse curvature being imparted to the flexible flap by the mounting of the flexible flap in contact with a portion of the seal ridge, the mounting of the flap causing the stationary portion of the flap to be pressed towards the seal ridge such that at least a portion of the stationary portion resides in non-alignment with the seal surface when viewing the valve in a longitudinal section (FIG. 4); the transverse curvature effecting biasing of the free portion of the flexible flap towards the seal surface under neutral conditions so that the flap maintains substantial contact with the seal surface of the valve seat in the absence of exhalatory pressure differential across the flap in any orientation of the valve, while also allowing the free portion of the flexible flap to be lifted from the seal surface during an exhalation.

48. (canceled)

49. (currently amended) The filter face mask of claim 47, wherein the flexible flap is mounted to the valve in cantilever manner by being trapped between respective surfaces on the valve seat and the valve cover.

50. (previously presented) The filter face mask of claim 47, wherein the outlet ports are oriented on the valve cover relative to the flexing of the flexible flap such that exhaled air from a wearer exits the exhalation valve with a downward component that directs the exhalate away from a wearer's eyes.

51. (previously presented) The filter face mask of claim 47, wherein the seal surface has multiple portions that include first and second side portions and a free-end portion, the free segment of the peripheral edge of the flexible flap having a flat configuration above the first and second side portions and the free end portion.

52. (previously presented) The filter face mask of claim 47, wherein the flexible flap's transverse curvature progressively decreases towards an outer end of the free portion of the flexible flap.

53. (previously presented) The filter face mask of claim 47, wherein the valve seat and valve cover are inter-fitting plastic parts.

54. (previously presented) The filter face mask of claim 47, wherein said stationary portion of the flexible flap is permanently configured for embracing a portion of the valve seat.

55-63 (canceled)

64. (currently amended) A filter face mask that comprises:

(a) a mask body adapted to fit over a nose and a mouth of a wearer; and

(b) an exhalation valve mounted to the mask body, the exhalation valve comprising a flexible flap and a valve seat, the flexible flap being mounted to the valve seat in cantilever fashion such that it has a longitudinal dimension, the flexible flap having a free end that rests upon the valve seat when closed, the flexible flap exhibits a curvature in a direction transverse to the flexible flap's longitudinal dimension, the transverse curvature biasing the flexible flap to assist in closing the valve in the absence of an opening pressure differential across the flexible flap, under any orientation of the valve wherein the flexible flap has a transverse curvature at the location where the flexible flap is mounted to the valve seat.

65. (canceled)

66. (currently amended) The fluid valve of claim 64, wherein the transverse curvature of the flexible flap decreases in the longitudinal dimension toward a free end of the flexible flap.

67. (currently amended) The filter mask of claim 66, wherein the transverse curvature is imparted to the flexible flap by virtue of its mounting to the valve seat.

68. (previously presented) The filter mask of claim 67, wherein the flexible flap is mounted to the valve seat by being pressed toward the valve seat by a member disposed on a valve cover.

69. (previously presented) The filter mask of claim 64, wherein the exhalation valve is so located on the mask such that during normal head movements of a wearer, the free end of the flexible flap is generally directed downward.

70. (currently amended) A filter face mask that comprises:

(a) a mask body that is adapted to fit over a nose and mouth of a wearer; and

(b) an exhalation valve that is mounted to the mask body, the exhalation valve comprising a flexible flap, a valve seat, and a valve cover, the valve seat comprising one or more inlet ports, which one or more ports are surrounded by a seal surface, the valve cover comprising one or more outlet ports and being joined to the valve seat, the flexible flap being mounted to the valve seat and having only one stationary portion and only one free portion and a peripheral edge that includes stationary and free segments at opposite ends of a longitudinal axis of the flap, the stationary segment of the flexible flap's peripheral edge being associated with the stationary portion of the flexible flap so as to remain stationary during an exhalation, and the free segment of the flexible flap's peripheral edge being associated with the free portion of the flexible flap so as to be movable during an exhalation, the flexible flap having a curvature in a direction transverse to the longitudinal axis of the flap, the transverse curvature being imparted to the flexible flap by the mounting of the flexible flap at the stationary portion off-center relative to the flap and closer to the stationary segment of the flap's peripheral edge than to the free segment, the mounting of the flexible flap at the stationary portion being accomplished by having a member from the valve cover press against the flap to create sufficient curvature in the flap at a point where the member contacts the flap to cause at least part of the stationary portion to reside in non-alignment with the seal surface when viewing the flap in a longitudinal section (FIG. 4), the member causing a biasing of the free portion of the flexible flap toward the seal surface under neutral conditions while also allowing the free portion of the flexible flap to be lifted from the seal surface during an exhalation.

71. (canceled)

72. (currently amended) The filter face mask of claim 70, wherein the flexible flap is mounted to the valve by being trapped between respective surfaces on the valve seat and the valve cover.

73. (previously presented) The filter face mask of claim 70, wherein the outlet ports are oriented on the valve cover relative to the flexing of the flexible flap such that exhaled air from a wearer exits the exhalation valve with a downward component that directs the exhalate away from a wearer's eyes.

74. (currently amended) The filter face mask of claim 72, wherein the seal surface has multiple portions that include first and second side portions and a free-end portion, the free segment of the peripheral edge of the flexible flap having a flat configuration above the first and second side portions and the free end portion.

75. (currently amended) The filter face mask of claim 74, wherein the flexible flap's transverse curvature decreases towards the free segment of the peripheral edge of the flexible flap.

76. (previously presented) The filter face mask of claim 75, wherein the flexible flap lies flat against the seal surface that is disposed beneath the free end of the flexible flap.

77. (previously presented) The filter face mask of claim 70, wherein the valve seat and valve cover are inter-fitting plastic parts.

78. (currently amended) The filter face mask of claim 70, wherein the stationary portion of the flexible flap is configured for embracing a member on the valve seat.

79. (previously presented) The filter face mask of claim 70, wherein the exhalation valve is positioned on the mask body and the flexible flap is positioned on the valve seat such that the free portion of the flap resides below the stationary portion when the mask is worn in its normal upright position over the nose and mouth of the wearer.

80. (previously presented) The filter face mask of claim 79, wherein the flexible flap has no more than one free portion and no more than one stationary portion.

81. (currently amended) The filter face mask of claim 72, wherein the flexible flap is mounted to the valve seat off-center relative to the flap.

82. (currently amended) The filter face mask of claim 81, wherein the flexible flap is mounted closer to the stationary segment of the peripheral surface than to the free segment.

83. (currently amended) The filter face mask of claim 82, wherein the transverse curvature constitutes an arching of the flap in a dimension transverse to a longitudinal dimension of the flap.

84. (previously presented) The filter face mask of claim 83, wherein the flexible flap also has a curvature in the longitudinal dimension, which curvature is imparted to a central section of the flap.

85. (previously presented) The filter face mask of claim 84, wherein the transverse curvature of the flap decreases in the longitudinal dimension moving from a point where the flap is mounted to the valve seat towards the free segment of the flap's peripheral edge.

86. (new) A filter mask that comprises:

(a) a mask body that is adapted to fit over the nose and mouth of a person; and

(b) a unidirectional exhalation valve that is mounted to the mask body to enable exhaled air to exit an interior of the mask body during an exhalation, the unidirectional exhalation valve comprising:

(i) a cantilevered flexible flap that has a stationary portion and a free portion and has a peripheral edge that includes opposing first and second side edges and opposing stationary and free edges, the stationary and free edges being located at opposing ends of a longitudinal axis of the flap, the first and second peripheral side edges extending between the stationary edge and the free edge,

(ii) a valve seat having sealing surfaces that contact the cantilevered flexible flap along the stationary and free edges and first and second side edges when the valve is closed; and

(iii) a valve cover that has a profiled block that engages the flexible flap at the stationary portion to press the flap towards the valve seat to cause the flexible flap to exhibit a curvature at least in a direction transverse to the longitudinal axis, the transverse curvature biasing the flap and maintaining the flap in substantially in contact with all the sealing surfaces of the valve seat in the absence of an opening pressure differential across the valve, under any orientation of the valve while also allowing the free edge and at least portions of the peripheral side edges to flex away from the respective sealing surfaces of the valve seat during an exhalation.

87. (new) The filter mask of claim 86, wherein the profiled block engages the flap at a non-central location of the flap in a non-aligned relationship to the sealing surfaces to create an arched configuration transversely to the longitudinal axis, wherein the arched configuration decreases along the longitudinal axis in a direction going from the location where the profiled block engages the flap towards the free segment of the flap's peripheral edge, and wherein the flap is trapped between respective surfaces on the profiled block and on the valve seat.

88. (new) The filter mask of claim 87, wherein the sealing surfaces have multiple portions that include first and second side portions and a free end portion, the free segment of the peripheral edge of the flexible flap having a flat configuration above the first and second side portions and the free end portion.

89. (new) A filter mask that comprises:

(a) a mask body; and

(b) a unidirectional exhalation valve that is secured to the mask body, the unidirectional exhalation valve comprising:

(i) a flexible flap that has only one stationary portion and only one free portion and that has a peripheral edge that includes a stationary segment and a free segment, the stationary segment being associated with the stationary portion of the flap so as to remain stationary during an exhalation and the free segment of the flap being associated with the free portion of the flap so as to be moveable during an exhalation, the stationary and free segments of the peripheral edge being disposed at opposing ends of a longitudinal dimension of the flap;

(ii) a valve seat that has at least one port to allow exhaled air to exit the mask body when worn on a person, the valve seat also comprising a seal surface onto which the stationary and free portions of the flap make contact when no fluid is passing through the port(s), the free portion of the flap being capable of being lifted from the seal surface when a wearer exhales to allow exhalate to exit the mask, the seal surface surrounding the port(s) so that when the stationary and free portions of the flap are in contact with the seal surface fluid cannot pass through the port(s) in an opposite direction to enter the mask, the flexible flap being mounted to the valve seat to create a fixed curvature in the flap in a direction transverse to the longitudinal dimension, the fixed curvature being accomplished by exerting a force on the flexible flap to move the flap towards the valve seat such that the flap, at the location where the force is exerted, is non-aligned with the seal surface, the exerted force and the non-aligned relationship between the seal surface and the flap at the location of the force, imparting the curvature and biasing the flap towards the seal surface to enable the free portion of the flap to maintain substantial contact with the seal surface under any orientation of the mask when a fluid is not passing through the valve seat port(s).

90. (new) The filter face mask of claim 87, further comprising a valve cover that has a profiled block extending therefrom, the profiled block engaging the flap so as to create the force needed to impart an arched curvature to the flap.

91. (new) The filter face mask of claim 90, wherein the profiled block engages the flap at a non-central location of the flap in a non-aligned relationship to the sealing surfaces to create an arched configuration transversely to the longitudinal axis, wherein the arched configuration decreases along the longitudinal axis in a direction going from the location where the profiled block engages the flap towards the free segment of the flap's peripheral edge, and wherein the flap is trapped between respective surfaces on the profiled block and on the valve seat.

92. (new) A filter mask that comprises:

(a) a mask body; and

(b) a unidirectional exhalation valve that is secured to the mask body, the unidirectional exhalation valve comprising:

(i) a flexible flap that has a stationary portion and a free portion and that has a peripheral edge that includes a stationary segment and a free segment, the stationary segment being associated with the stationary portion of the flap so as to remain stationary during an exhalation and the free segment of the flap being associated with the free portion of the flap so as to be moveable during an exhalation, the stationary and free segments of the peripheral edge being disposed at opposing ends of a longitudinal dimension of the flap;

(ii) a valve seat that has at least one port to allow exhaled air to exit the mask body when worn on a person, the valve seat also comprising a seal surface onto which the stationary and free portions of the flap make contact when no fluid is passing through the port(s), the free portion of the flap being capable of being lifted from the seal surface when a wearer exhales to allow exhalate to exit the mask, the seal surface surrounding the port(s) so that when the stationary and free portions of the flap are in contact with the seal surface fluid cannot pass through the port(s) in an opposite direction to enter the mask, the flexible flap being mounted to the valve seat in a cantilevered manner and to create a fixed curvature in the flap in a direction transverse to the longitudinal dimension, the fixed curvature being accomplished by exerting a force on the flexible flap to move the flap towards the valve seat such that the flap, at the location where the force is exerted, is non-aligned with the seal surface, the exerted force and the non-aligned relationship between the seal surface and the flap at the location of the force, imparting the curvature and biasing the flap towards the seal surface to enable the free portion of the flap to maintain substantial contact with the seal surface under any orientation of the mask when a fluid is not passing through the valve seat port(s).

93. (new) The filter face mask of claim 92, further comprising a valve cover that has a profiled block extending therefrom, the profiled block engaging the flap so as to create the force needed to impart an arched curvature to the flap.

94. (new) The filter mask of claim 92, wherein the flap's peripheral edge has two peripheral side edges located between a stationary end and a free end, wherein the free end and at least portions of the peripheral side edges are freely movable to flex away from portions of the seal surface that the flap would contact when in a closed condition.

95. (new) A filter mask that comprises:

a mask body that is adapted to fit over the nose and mouth of a person; and

a unidirectional exhalation valve that is mounted to the mask body to enable exhaled air to exit an interior of the mask body during an exhalation, the exhalation defining a downstream direction and an opposite upstream direction, the unidirectional exhalation valve comprising:

a cantilevered flexible flap and a cooperating valve seat surrounding a valve orifice;

the cantilevered flexible flap defining a root end and a free end at opposite ends of a longitudinal axis of the flap, and two peripheral side edges respectively extending between the root end and the free end; wherein the root end, the free end, and the two side edges include upstream and downstream surfaces;

the valve seat having sealing surfaces that contact the flap along portions of the upstream surface of the root end, the free end, and the peripheral side edges when the fluid valve is closed;

the cantilevered flexible flap being mounted in contact with the respective sealing surface of the valve seat at the root end and being freely movable to flex away from the respective sealing surface of the valve seat at the free end and along at least portions of the peripheral side edges when fluid flows through the fluid valve and the fluid valve is open; and

wherein said mounting of the flexible flap to the valve seat creates a fixed curvature in the flap in a direction transverse to the longitudinal axis, the fixed curvature resulting from a force being applied to the flap at a position proximate the root end and between the peripheral side edges, the applied force moving the flap upstream at the applied position and thus imparting the curvature, the curvature resulting in maintaining the flap substantially in contact with the sealing surfaces of the valve seat in the absence of an opening pressure differential across the flap, in any orientation of the valve.

96. (new) The mask of claim 95, wherein the transverse curvature in the flap includes a fixed transverse curvature in the root end of the flap at a location spaced inward from the portion of the root end that contacts the sealing surface.

97. (new) The mask of claim 95, further comprising a valve cover having a block for mounting the flap in contact with the sealing surfaces; wherein the block exerts the force in the upstream direction to the lower surface of said flap resulting the transverse curvature.

98. (new) The mask of claim 97, wherein the transverse curvature in the flap includes a fixed transverse curvature in the flap in said root end at a location of said root end located between the block and the portion of the of the root end that contacts the sealing surface.

99. (new) The mask of claim 98, wherein said block has a width that is less than a transverse distance between opposite side edges of the orifice.

100. (new) The mask of claim 95, wherein said cantilevered arrangement of said flexible flap is defined by the flap being supported proximate said root end and the free end being unsupported.

101. (new) The mask of claim 97, wherein said cantilevered arrangement of the flexible flap is defined by said flap being supported by at least said block at or adjacent said root end, and by the free end being unsupported.

102. (new) The mask of claim 97, wherein said cantilevered arrangement of the flexible flap is defined by said flap being supported between said block and the sealing surfaces at the root end, and by the free end being unsupported.

103. (new) The mask of claim 97, wherein the root end includes an outer edge surface, and wherein the sealing surface contacts the root end inward from the outer edge surface.

104. (new) A filter mask that comprises:

a mask body that is adapted to fit over the nose and mouth of a person; and

a unidirectional exhalation valve that is mounted to the mask body to enable exhaled air to exit an interior of the mask body during an exhalation, the exhalation defining a downstream direction and an opposite upstream direction, the unidirectional exhalation valve comprising:

a cantilevered flexible flap and a cooperating valve seat surrounding a valve orifice;

the cantilevered flexible flap defining a root end and a free end at opposite ends of a longitudinal axis of the flap, and two peripheral side edges respectively extending between the root end and the free end; wherein the root end, the free end, and the two side edges have upper and lower surfaces;

the valve seat having sealing surfaces that contact the flap along portions of the upstream surface of the root end, the free end, and the peripheral side edges when the fluid valve is closed;

the cantilevered flexible flap being mounted in contact with the respective sealing surface of the valve seat at the root end and being freely movable to flex away from the respective sealing surface of the valve seat at the free end and along at least portions of the peripheral side edges when fluid flows through the fluid valve and the fluid valve is open; and

wherein the mounting of the flexible flap to the valve seat creates a fixed curvature in the flap in a direction transverse to the longitudinal axis, the fixed curvature resulting from a force being applied to said flap in an upstream direction at a position proximate the root end and between the peripheral side edges, the applied force moving the flap upstream at the applied position and thus imparting the curvature, the curvature resulting in maintaining the flap substantially in contact with the sealing surfaces of the valve seat in the absence of an opening pressure differential across the flap, in any orientation of the valve;

wherein the transverse curvature in the flap includes a fixed transverse curvature in the root end of the flap at a location spaced inward from the portion of the root end that contacts the sealing surface;

wherein the cantilevered arrangement of the flexible flap is defined by said flap being supported proximate the root end, and by said free end being unsupported.

105. (new) The mask of claim 103, further comprising a valve cover having a block for mounting said flap in contact with said sealing surfaces; wherein the block exerts the force in the upstream direction to the lower surface of the flap resulting the fixed transverse curvature.

106. (new) The mask of claim 105, wherein the transverse curvature in the flap includes a fixed transverse curvature in the flap in the root end at a portion of the root end located between the block and the portion of the of the root end that contacts the sealing surface.

107. (new) The mask of claim 106, wherein the block has a width that is less than a transverse distance between opposite side edges of the orifice.

108. (new) The mask of claim 105, wherein the cantilevered arrangement of the flexible flap is defined by the flap being supported by at least the block at or adjacent the root end, and by the free end being unsupported.

109. (new) The mask of claim 105, wherein the cantilevered arrangement of the flexible flap is defined by the flap being supported between the block and the sealing surfaces at the root end, and by the free end being unsupported.

110. (new) The mask of claim 105, wherein the upper surface of the root end includes an outer edge surface, and wherein the sealing surface contacts the root end inward from the outer edge surface.

111. (new) A filter mask that comprises:

a mask body that is adapted to fit over the nose and mouth of a person; and

a unidirectional exhalation valve that is mounted to the mask body to enable exhaled air to exit an interior of the mask body during an exhalation, the exhalation defining a downstream direction and an opposite upstream direction, the unidirectional exhalation valve comprising:

a cantilevered flexible flap and a cooperating valve seat surrounding a valve orifice; the cantilevered flexible flap defining a supported end and a free end at opposite ends of a longitudinal axis of the flap, and two peripheral side edges respectively extending between the supported end and the free end; wherein the supported end, the free end, and the two side edges include upstream and downstream surfaces;

the valve seat having sealing surfaces that contact the flap along portions of the upstream surfaces of the supported end, the free end, and the peripheral side edges when the fluid valve is closed;

the cantilevered flexible flap being mounted in contact with the respective sealing surface of the valve seat at the supported end and being freely movable to flex away from the respective sealing surface of the valve seat at the free end and along at least portions of the peripheral side edges when fluid flows through the fluid valve and the fluid valve is open; and

wherein the mounting of the flexible flap to the valve seat creates a fixed curvature in the flap in a direction transverse to the longitudinal axis, the fixed curvature resulting from a force being applied to said flap at a position within the supported end and between the peripheral side edges, the applied force moving the flap upstream at the position and thus imparting the curvature, the curvature resulting in a biasing of the flap towards the seal surface to enable the free end of the flap to maintain substantial contact with the sealing surfaces in the absence of an opening pressure differential across the flap, in any orientation of the valve.

112. (new) The mask of claim 111, wherein the transverse curvature in the flap includes a fixed transverse curvature in the supported end of the flap at a location spaced inward from the portion of the of the supported end that contacts the sealing surface.

113. (new) The mask of claim 111, further comprising a valve cover having a block for mounting the flap in contact with said sealing surfaces; wherein said block exerts a force in the upstream direction to said lower surface of the flap resulting the fixed transverse curvature.

114. (new) The mask of claim 113, wherein the transverse curvature in the flap includes a fixed transverse curvature in the flap in the supported end between the profiled block and the portion of the of the supported end that contacts the sealing surface.

115. (new) The mask of claim 114, wherein the block has a width that is less than a transverse distance between opposite side edges of the orifice.

116. (new) The mask of claim 111, wherein the cantilevered arrangement of the flexible flap is defined by the flap being supported at the supported end and the free end being unsupported.

117. (new) The mask of claim 113, wherein the cantilevered arrangement of the flexible flap is defined by the flap being supported by at least the block at the supported end, and by the free end being unsupported.

118. (new) The mask of claim 113, wherein the cantilevered arrangement of the flexible flap is defined by the flap being supported between the block and the sealing surfaces at the supported end, and by the free end being unsupported.

119. (new) The mask of claim 113, wherein the root end includes an outer edge surface, and wherein said sealing surface contacts said supported end inward from the outer edge surface.

120. (new) A filter mask that comprises:

a mask body that is adapted to fit over the nose and mouth of a person; and

a unidirectional exhalation valve that is mounted to the mask body to enable exhaled air to exit an interior of the mask body during an exhalation, the exhalation defining a downstream direction and an opposite upstream direction, the unidirectional exhalation valve comprising:

a cantilevered flexible flap and a cooperating valve seat surrounding a valve orifice;

the cantilevered flexible flap defining a supported end and a free end at opposite ends of a longitudinal axis of the flap, and two peripheral side edges respectively extending between the supported end and the free end; wherein the supported end, the free end, and the two side edges include upstream and downstream surfaces;

the valve seat having sealing surfaces that contact the flap along portions of the upstream surfaces of the supported end, the free end, and the peripheral side edges when the fluid valve is closed;

the cantilevered flexible flap being mounted in contact with the respective sealing surface of the valve seat at the supported end and being freely movable to flex away from the respective sealing surface of the valve seat at the free end and along at least portions of the peripheral side edges when fluid flows through the fluid valve and the fluid valve is open; and

means for mounting the flexible flap to the valve seat wherein the mounting means creates a fixed curvature in the flap in a direction transverse to the longitudinal axis, the curvature resulting in a biasing of the flap towards the seal surface to enable the free end of the flap to maintain substantial contact with the sealing surfaces in the absence of an opening pressure differential across the flap, in any orientation of the valve.

121. (new) The valve of claim 120, wherein the mounting means includes a block that exerts a force in the upstream direction to the flap's downstream surface at a position within the supported end and between the peripheral side edges, the applied force moving the flap upstream at the exerted position and thus imparting the curvature.